# The Wealth of the Unemployed

Jonathan Gruber
MIT and NBER

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While there has been considerable discussion of the adequacy of unemployment insurance (UI) benefits as a form of income replacement, there is little evidence on the other resources that the unemployed have to finance their unemployment spells. In this paper I focus on focus on one form of resources, own wealth holdings. I find that the median worker has financial assets sufficient to finance roughly two-thirds of the income loss from an unemployment spell, but that there is tremendous heterogeneity in wealth holdings; almost one-third of workers can't even replace 10% of their income loss. Most strikingly, ex-ante wealth holdings decline precipitously with realized unemployment durations, *both* absolutely and (especially) relative to ex-post income loss, suggesting that adequacy could be increased if UI benefits were targeted to those with longer spells. I also find strong evidence that individuals who are eligible for more generous UI draw down their wealth more slowly during unemployment spells. This demonstrates that wealth is used as a consumption smoothing device alongside UI to cope with the income loss from unemployment.

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A central question for the design of the unemployment insurance (UI) program is the adequacy of UI benefits, in terms of maintaining the standard of living of recipients while unemployed. A number of empirical studies have examined the level of UI benefits relative to the previous earnings of the unemployed, and the distribution of this replacement rate, as a measure of adequacy of the system. But this empirical literature has not generally recognized that the extent to which UI benefits are adequate will be a function of the private resources that individuals have available to finance their unemployment spells. If individuals have little assets available when they lose their job, then UI benefits may be an integral part of their effort to maintain their standard of living; but if individuals who lose their jobs have substantial assets, then the generosity of UI benefits is of little relevance to adequacy. Indeed, private savings plays a critical role in the theoretical literature on both the optimal level of UI benefits (Baily, 1978), and their optimal time pattern (Shavell and Weiss, 1979). Surprisingly, however, there is little previous evidence on the wealth holdings of those becoming unemployed, and the role that UI plays in determining wealth decumulation during unemployment spells.

In this paper I remedy this deficiency by using data from the Survey of Income and Program Participation (SIPP). The SIPP is a large nationally representative survey which follows households over a period of 2-3 years. These longitudinal data allow one to measure both pre and post-separation characteristics of those becoming unemployed. Most importantly, the SIPP also collects information from two points in time (one year apart) on the wealth holdings of households. This allows me to examine both the ex-ante wealth levels of those becoming unemployed, as well as how they use their wealth while unemployed.

I use these data to address three questions about the wealth of the unemployed. First, how large

are wealth holdings relative to the income risk from unemployment? This goes directly to the question of UI benefit adequacy. Second, how does the adequacy of ex-ante wealth holdings vary with the characteristics of the unemployed? Identifying the key correlates of wealth adequacy can be important for thinking about more effectively targeting UI spending. Third, how does the use of wealth by the unemployed interact with the generosity of the UI system? It can be argued that one role of UI is to reduce the need for individuals to force themselves into destitution by selling all of their assets. Do unemployed persons rely less on their own wealth, and more on the UI system, to finance their unemployment spells where UI is more generous?

To summarize, I have four key findings. First, for the median worker, savings appears largely adequate to finance most of the income loss from a single unemployment spell. The typical worker has gross financial assets that can replace 73% of their realized income loss from unemployment. At the same time, almost one-third of workers can't even replace 10% of their income loss. On the other hand, total asset holdings, including (potentially) illiquid assets such as housing wealth, are much larger than the realized income loss from the spell.

Second, ex-ante wealth holdings of those becoming unemployed vary in important and systematic ways across the population. Older and white workers have gross financial asset holdings which are roughly equal to their income loss during unemployment spells, and those on temporary layoff have ex-ante wealth holdings which substantially exceed their ex-post income loss. Most strikingly, ex-ante wealth holdings decline precipitously with realized unemployment durations, *both* absolutely and (especially) relative to ex-post income loss. These findings suggest that adequacy could be greatly enhanced by targeting UI benefits more towards those likely to have longer spells, although this directly contradicts incentive considerations

in the design of optimal UI benefits.

Finally, there is strong evidence that individuals who are eligible for more generous UI draw down their wealth more slowly during unemployment spells. This demonstrates that wealth is used as a consumption smoothing device alongside UI to cope with the income loss from unemployment.

The paper proceeds as follows. In Part I, I provide some background on the literature focusing on the adequacy of UI benefits. In Part II, I describe my data source and discuss the methodological issues involved with answering the questions posed above. In Part III, I present the results on ex-ante adequacy. Part IV analyzes the use of wealth during unemployment spells, and how this interacts with the UI system. Part V concludes.

## Part I: Background on Adequacy

The study of UI benefits adequacy has a long history; see O'Leary (1996) for an excellent review. Previous studies have generally been of three types. The first computes the distribution of income replacement rates from UI benefits; for example, these studies assess the share of the workforce for which UI benefits replaced at least one-half of their foregone income. The second type compares UI benefits instead to previous consumption expenditures, particularly expenditures on "necessities". The advantage of this approach is that the goal of the UI program is explicitly to maintain living standards, not necessarily income levels.

But both of these approaches have an important weakness: they assume that there is no offsetting response of other resource flows to differences in UI generosity. That is, individuals may have a variety of private mechanisms upon which they can draw to finance their consumption when they have an

unemployment spell. To the extent that these other resources are available, increases in UI benefits will simply crowd them out, reducing the direct impact of UI on well-being. In the limit, if individuals held complete private insurance against unemployment spells, then UI would have no effect: for each dollar of increased UI benefits entitlement, individuals would hold one dollar less of private insurance, so that their total coverage was unchanged.

There are a number of potential sources of private insurance against unemployment spells. The most obvious is individual wealth accumulation. Particularly for individuals who can anticipate having regular unemployment spells, own savings can serve as a consumption smoothing device that substitutes for the income that is not replaced by UI. Another mechanism is family labor supply; if the head of the household loses his job, his wife (or other family members) may be able to increase their labor earnings to compensate for the income reduction. Other mechanisms include private supplemental unemployment insurance, other government transfer programs (such as food stamps), and transfers from other family members or charitable institutions.

The fact that UI may "crowd out" these other forms of insurance leads to an alternative metric for assessing adequacy: the extent to which UI benefits are reflected in consumption behavior. This question is studied by Browning and Crossley (1996), Gruber (1997), and Hamermesh and Slesnick (1996). Gruber and Hamermesh and Slesnick's findings suggest that UI benefits are fairly adequate, in that the consumption of the unemployed in the U.S. falls little given the existence of UI, but would fall substantially if UI were not present. Browning and Crossley, using Canadian data, find that UI is not very adequate,

in that the consumption of the unemployed falls substantially and UI plays little consumption smoothing role.[1]

The estimates in Gruber (1997) illustrate that increases in UI benefits are not translated directly to increased consumption; he finds that consumption rises by only 27 cents for each dollar of UI eligibility. This implies that there are other resources being used by the unemployed to smooth their spells. One resource, as noted above, is the labor supply of spouses, and the interaction between UI and spousal labor supply is investigated directly by Cullen and Gruber (2000). This paper finds that the labor supply of the wives of unemployed husbands is very responsive to the unemployment compensation received by those husbands: for each dollar of UI for which a husband is eligible, his wife earns approximately 36 cents less.

A second resource is drawing down own savings to finance unemployment spells. Unfortunately, however, we know very little about the wealth holdings of the unemployed; while there has been much distributional analysis of the unemployed population, to my knowledge no previous study has assessed their wealth holdings. Yet, for thinking about adequacy, it is critical to measure the wealth that the unemployed can tap during their unemployment spells. That is the purpose of this paper.

A closely related analysis is that of Engen and Gruber (forthcoming), which examines the extent to which UI generosity affects the wealth accumulation of the employed. In fact, the authors find a very large percentage crowd out of savings by UI: for each 10 percent increase in UI generosity savings falls by 2.8%. But, since that paper focused on the employed, it did not measure specifically the asset holdings of those becoming unemployed. As well, it did not study how wealth was used during unemployment spells. Of

[1]The differences between this study and the U.S. based studies probably arise from (a) the fact that Browning and Crossley focus only on the long-term unemployed (6 months or more), and (b) the fact that there is little variation in the UI replacement rate in Canada, where UI benefits are determined by a national program, relative to the US, where there is variation from state to state.

course, a natural implication of a response of wealth holdings to UI generosity is that wealth changes during the unemployment spell will be a function of UI as well; if more generous UI reduces wealth levels, it should most likely also reduce use of wealth as a financing mechanism during the spell. That hypothesis is tested below.

Of course, a natural implication of the Engen and Gruber results is that the wealth tabulations that we examine here are conditional on the response of wealth holdings to UI systems. As a result, wealth holdings will be lower than they would be in the absence of UI. So these tabulations understate the potential of wealth to buffer unemployment shocks, to the extent that in the absence of UI wealth holdings would be higher than shown here.

## Part II: Data and Methodology

*Data*

The data for this analysis are from the SIPP panels for 1984-1992. The SIPP follows respondent households for 2-3 years, with interviews every four months. At those interviews, respondents are asked retrospective questions about their income and labor force behavior over the previous four months. As a result, the SIPP therefore provides monthly data on income and weekly data on labor force status.[2]

At two points in most SIPP panel (generally waves 4 and 7), respondents are interviewed about their wealth holdings. Data are collected on a wide inventory of assets. For the purposes of this analysis,

[2]In practice, there is a large amount of "seam bias" whereby individuals propagate their status at the point of the interview back through the previous four months. This problem is more important for income and government transfer receipt than for labor force status. This will lend some imprecision to the analysis here, but should not impose any systematic bias to the calculations.

I focus on three measures of assets. Two, gross and net financial assets, measure liquid wealth: gross financial assets consist of interest earning assets in banking and other institutions, household equity in stocks and mutual funds, and other assets such as bonds and checking accounts; net assets subtracts off unsecured debt from this total. The third, total net worth, measures the sum of all household assets, liquid and illiquid, including (in addition to those previously mentioned) equity in retirement savings accounts, homes, vehicles, and personal businesses.

There are advantages and disadvantages to each of these different measures. Gross asset holdings most closely approximate the steady state stock of accumulated precautionary savings, whereas net assets also reflect short run smoothing through consumption loans. Furthermore, debt holding may not proxy for financial constraint but rather access to debt markets.[3] On the other hand, a person with substantial accumulated unsecured debt may not be in a very good position to finance his unemployment spell, so it is also of interest to examine net financial assets. Total net worth has the advantage that it ignores the decision to divide one's wealth into financial and non-financial instruments, thereby summarizing the total resources available to a family. But it has the disadvantage that illiquid assets such as housing wealth (the dominant form of wealth for most sample households) may be difficult to access in times of transitory income fluctuation such as an unemployment spell.

A further consideration is data quality. For the 1984-1986 panels, the SIPP collected a full inventory of family level asset holdings at two points in time.[4] From the 1987 panel onwards, however, the

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[3]That is, an individual with slightly negative net assets may actually have more precautionary savings than a person with slightly positive net assets, if they have better access to unsecured borrowing.

[4]In the 1985 panel, the first wealth inventory is collected in the third wave rather than the fourth.

full inventory was collected at only one interview (generally the first of the two); in the other interview, data on gross financial assets was collected, but not data on unsecured debt or home equity. As a result, there is much more complete information on gross financial assets, particularly for analyzing the change in the family's wealth position. Moreover, studies of the quality of the SIPP data conclude that the information on financial assets is reliable, but that information on non-financial assets (in particularly business equity) may not be (Curtin et al., 1989). This mitigates further towards a focus on financial assets.

A final important consideration is imputed data. Roughly one-quarter of the households in our data set have imputed information on gross financial assets, and the fraction rises to close to one-half for total net worth. The SIPP imputation methodology has been criticized by a number of commentators (Curtin et al., 1989; Hoynes et al., 1995). On the other hand, the probability of imputation is not random; for example, it rises with income (and therefore with wealth). As a result, if I exclude imputed values it will bias the estimates towards understating the resources of the unemployed; including imputations will add noise to the estimates, but no obvious direction to the bias. I therefore include imputed values.[5]

The sample consists of all spells of unemployment, which are spells following a job separation during which individuals are either on layoff or are searching for a new job. I consider all such spells regardless of duration. It is important to note, however, that there are no data in the SIPP on the reason for the separation. In particular, my sample will include those whose separations arose from both voluntary and involuntary separation. As a result, if individuals build up assets in anticipation of a voluntary

[5]Results without imputed values are available from the author. These results consistently show wealth adequacy which is about 50% lower than that shown below, reflecting the fact that those with imputed values have higher wealth. But there is no systematic effect on any of the cross-sectional patterns or regression results presented below.

separation, then these results may overstate the wealth holdings of those involuntarily unemployed.[6]

I also consider two other samples to provide a basis for comparison. The first is those who separate from their job, but who are not on layoff and not searching for a new job (labor force leavers). The second is a random sample of persons who do not separate from their jobs during the SIPP panel. For the unemployed and labor force leavers, I use separations that occur after the first wealth interview, but before the second, in order to consider wealth holdings before the separation and the change in wealth holdings during the spell.[7]

The sample is drawn based on the unemployment spell, in order to capture the features of the representative spell. As a result, about 85% of the observations in each sample are either from persons with only one spell or from the first spell for a person with multiple spells; the remainder are multiple spells.

*Empirical Strategy*

The first step of the analysis is to tabulate the ex-ante wealth holdings of those becoming unemployed. As a numerator, I use the three wealth measures described. To normalize wealth, I use two types of denominators. The first is weekly earnings, net of income and payroll taxes paid, in the quarter before separation. This provides a sense of how many weeks of unemployment the typical individual could

[6]The fact, documented below, that labor force leavers have much higher asset levels than do the unemployed supports the notion that those leaving their job voluntarily will have higher assets that do those leaving involuntarily.

[7]This sampling rule results in an undersampling of very long spells, since they would be ongoing at the point of the first wealth interview. But it is important to have an ex-ante measure of wealth holdings to compare to the ex-post income loss from unemployment. I also select the sample based on having been in the SIPP for at least 9 months, in order to have a sufficient window of past earnings for computing UI eligibility and potential UI benefits. This is generally not a binding constraint for this sample (since the first wealth interview is done after individuals have been in the survey for 16 months), but some persons join the SIPP in progress.

finance from their savings. Income taxes paid are computed by applying the federal income tax schedule to the sum of previous own and spousal earnings; I exclude capital income since that is a direct function of the variable of interest, wealth holdings. In addition, I account for Social Security and Medicare payroll tax payments by applying the year specific tax rates for those programs, up to the taxable maximum of earnings.

The other denominator measure in different ways the income loss during the unemployment spell.[8] The first is simply the expected loss in net wages: net wages times the duration of the spell. The problem with this measure is that it fails to account for the fact that the job leaver potentially has access to the unemployment insurance system to provide income during the jobless spell, thereby overstating the loss of income during the jobless spell and understating the ratio of wealth to net income loss.[9] This is especially important since, as Engen and Gruber (forthcoming) show, wealth holdings are a function of the generosity of the UI system. As a result, it is after-UI expected loss which is the relevant determinant of wealth adequacy.

I therefore correct the expected income loss for the presence of UI in two ways. The first is to use potential UI benefits eligibility. That is, for each person becoming unemployed, I measure their eligibility for UI and their potential benefits entitlement. If they are eligible, I reduce the income loss by the UI to which they are entitled, accounting for the taxation of those UI benefits. Their net income loss from

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[8]Note that I measure the spell as consisting of all weeks of separation from work. For those who have some weeks of unemployment (either search or layoff), 80-85% of their spells are weeks of unemployment, and the remainder of the spell is weeks out of the labor force.

[9]In fact, there are many other resources that might be drawn upon during the jobless spell, such as the labor supply of spouses, which might cause a further understatement of the wealth/loss ratio. I do not consider these here since the magnitude of response is unclear ex ante.

unemployment is therefore:

(1) $W*D*(1-t_1) - UI*\max(D,26)*(1-t_2)$

where W is pre-unemployment weekly wage
D is duration of unemployment spell
UI is potential UI weekly benefits
$t_1$ is average tax rate for previous year
$t_2$ is average tax rate during year of unemployment

The first term in (1) is the first measure of expected loss, which ignores unemployment insurance. The second term is the potential UI income during the spell: the weekly benefit for the duration of the spell, up to a maximum entitlement of 26 weeks.[10] I also adjust for the fact that the tax rate that the person faces while unemployed is lower than while employed, since his income is lower. I do this by recalculating income for the year including the unemployment spell, which is a weighted average of this potential income from UI while unemployed and earnings from the previous job for the remaining (52-D) weeks.[11]

I calculate potential UI benefits and eligibility using a simulation program which models each state's

[10]In fact, many individuals are entitled to less than the full 26 weeks, but calculating potential duration of UI benefits is beyond the scope of this exercise. Moreover, in some states and years, individuals are entitled to more than 26 weeks if the state unemployment rate exceeds some "trigger" level, or if a Federal extended benefits program is in place. But in my SIPP sample fewer than 3% of observations receive UI benefits for more than 26 weeks.

[11]This tax calculation is simplified along a number of dimensions. I do not account for the precise calendar timing of the spell; I simply restart the year at the point that the spell begins. And I assume that the earnings on the post-spell job is equal to the earnings on the pre-spell job. Variations in these assumptions have little effect on the measure of expected loss in practice, since (particularly from 1987 onwards) the income tax system is relatively flat so that even moderate change in income don't much affect average taxes. Also, for some individuals with very low earnings it is possible that (1) could be negative; that is, UI replaces more than 100% of their earnings so that expected income is higher while jobless. I deal with these cases by setting the expected loss in income to be at least 5% of the expected non-UI income loss (the first term in (1)). Finally, I account for the partial taxation of UI benefits before 1987, and their full taxation afterwards.

UI rules over this time period.[12] Eligibility and benefits are determined based on earnings levels and distributions over the first four of the previous five quarters. For some individuals, I do not have sufficient earnings histories to calculate these constructs; I therefore expand the available earnings information to simulate the full required period. If individuals are assigned to be ineligible for UI, I sent UI = 0 in expression (1); for the regression analysis of Part IV, ineligibles are excluded from the sample.

The problem with this approach, however, is that it overstates the income smoothing role of UI, since, even among those eligible, takeup of UI is much less than full. For example, Blank and Card (1991) estimate takeup rates of roughly 2/3 among eligibles. An alternative which addresses this issues is to use actual UI received during the spell in place of potential benefits. I do so by replacing UI*max(D,26) in equation (1) with UI received during the spell. This measure is not ideal either, however, since receipt of public assistance has generally been found to be understated in survey data sets. Moreover, takeup of UI may itself be endogenous to wealth holdings.[13]

Thus, I present most results below for all three measures of income loss during the unemployment spell, in order to bound the true "wealth replacement rate". Ignoring UI clearly understates wealth adequacy, while using potential UI clearly overstates it; the expected loss using actual UI receipt lies somewhere inbetween.

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[12]See Gruber (1997) and Cullen and Gruber (2000) for a more detailed description of this simulation program. While this type of simulation of UI entitlements undoubtably provides a noisy proxy for potential benefits for any individual, the estimates of entitlements should be correct on average, and these other papers do find significant impacts of similar simulated UI variables on real behavior.

[13]This will be true, for example, if there is some fixed cost (ie. stigma) to UI takeup, so that individuals who have other sources of consumption smoothing that are sufficient do not take up.

## Part III: Ex-Ante Wealth Holdings

*The Distribution of Wealth Holdings*

Table 1 presents the distribution of wealth holdings of unemployed searchers. The first column presents the distribution of real wealth holdings, in 1994 dollars. The second column presents the distribution of wealth normalized by post-tax weekly earnings before the separation.

There are several noticeable features of the distribution of wealth holdings. First, financial wealth holdings are quite low on average: as noted earlier, roughly 17% of the sample has zero gross financial wealth, and the median person has only $1171. Moreover, if unsecured debt is excluded, the median person in this sample of searchers has zero financial wealth. Second, there is a very wide distribution; 25% of the sample has gross financial wealth of more than $7052, and net financial wealth of more than $4352. Third, when illiquid assets are included the sample appears much wealthier: only 12.3% of the sample has zero or negative net worth, and the median person has almost $22,000. Thus, for thinking about UI adequacy, it is critical to consider how able the unemployed are to tap into these other forms of assets during their jobless spells.

The next set of rows normalizes these wealth holdings by earnings; negative values of net assets are set to zero. Once again, there is a wide distribution of wealth adequacy here, and the findings differ dramatically according to the type of wealth measure employed. For gross financial assets, the median person has assets that are sufficient to cover 5.4 weeks of unemployment; in this sample, the median spell of unemployment is 11 weeks, so this is much less than would be required to cover an entire spell. This is even more true for net financial assets, although total net worth is certainly sufficient at the median to cover even much longer spells. Once again, for a large share of the sample, both gross and net financial

wealth are sufficient to cover a typical spell.

One interesting question that is raised by this analysis is: do these unemployed searchers have disproportionately low wealth holdings? This is addressed in Table 2, which performs comparable calculations for separators who do not become unemployed, and for those who remain employed. For each of the three wealth definitions, the first column shows absolute wealth in $1994 dollars; the second shows wealth relative to net weekly earnings.

In both absolute value and as a share of weekly earnings, the wealth holdings of these two groups are substantially higher than are those of the unemployed searchers. For both groups, median gross financial assets are sufficient to weather the loss of 10 or more weeks of earnings. Even for these groups, however, net financial assets are quite low at the median. Interestingly, while the wealth holdings of the employed are higher in absolute value, those of labor force leavers are actually higher as a share of earnings, reflecting the much lower earnings of this group. Thus, the wealth holdings of the unemployed do seem lower than for other groups, but even for others net financial wealth at the median is quite low.

*Wealth Holdings Relative to Expected Income Loss*

Table 3 extends this analysis by normalizing wealth holdings by the three measures of the expected income loss during the unemployment spell. In each case, I show the median ratio of wealth to expected income loss, using both last quarter and high quarter earnings. I then display the distribution of the sample across adequacy categories: wealth holdings that are less than 10% of the expected loss, 25% of the expected loss, 50% of the expected loss, and 100% of the expected loss. These categories are defined cumulatively, so that 1 minus the final row gives the share of the sample that has wealth that is higher than

the expected loss.

Note that one disadvantage with using realized ex post durations to normalize ex ante wealth holdings is that the duration of unemployment is itself likely to be a function of wealth. I attempted to correct for this by predicting unemployment durations and using this to normalize wealth, but I was unable to fit the distribution of durations with any accuracy, so that any calculations based on predicted duration were quite misleading. It is therefore important to note that, if spell duration is a function of wealth, then these calculations will overstate ex-ante adequacy to some extent. I address this point more explicitly below by cutting the sample by ex-post durations.

The first two cells of the table repeat the lesson of Table 1: the wealth holdings of the typical unemployed person are sufficient to replace roughly one-half of lost after-tax earnings during the unemployment spell. One third of the sample can replace less than 10% of the loss, and about 40% of the sample can replace the entire loss.

The next two columns show how this answer changes when we account in two different ways for the role of UI. Using UI eligibility, wealth holdings appear much more adequate; wealth exceeds the expected loss for the median person in the sample. Using UI receipt, the results are between the first two columns, with gross assets sufficient to replace roughly three-quarters of lost income. But the distribution across adequacy categories is fairly similar regardless of the denominator used, with between one-half and 60% of the sample having wealth lower than their expected income loss from unemployment.

Subtracting off unsecured debt makes wealth holdings appear much less adequate, as in Table 1. According to the second panel, 60% of the sample has net financial assets that are lower than 10% of the expected income loss from unemployment. Only 25-30% of the sample has net financial assets which

exceed the expected income loss. And net worth is once again quite large relative to the expected income loss, with only 25% of the sample have net worth that is less than their expected loss from the unemployment spell.

To summarize, the data present a mixed picture of wealth adequacy. The typical worker has gross financial assets that can replace 73% of their realized income loss from unemployment. But almost one-third of workers can't even replace 10% of their income loss, and if debt is subtracted off from financial assets this figure rises to three-fifths of workers unable to replace 10% of their income loss. On the other hand, if all assets, and not just financial assets, are included, three-quarters of workers can replace all of their income loss from unemployment.

*Heterogeneity by Demographics and Spell Type*

The results thus far have not distinguished at all the different types of persons becoming unemployed. But there are a number of dimensions along which adequacy might vary. Several of these are explored in Table 4. Each row in this table presents the analysis for a separate group. There are columns for: the median wealth holdings in dollars; the median ratio of wealth to expected income loss, where expected loss is defined using the UI receipt concept; and the distribution of wealth/expected loss.

The first four rows distinguish the sample by sex and then by marital status. On average, the wealth holdings of men who become unemployed are slightly higher than are those of women, but relative to earnings they are somewhat lower for men. Wealth holdings are even lower for married men. This is consistent with the notion that married men have another form of insurance on which they can rely if they lose their jobs: their wife's labor supply (Cullen and Gruber, 2000). This pattern is not apparent for

women, which likely reflects that roughly 90% of their husbands are working in any case so that there is little scope for a reverse "added worker effect". Nevertheless, across all of the first four rows there is little difference in terms of the distribution of wealth holdings relative to expected loss.

Splitting the sample of men by age, there is much more adequate savings for older men. This likely reflects life cycle savings which also provides more of a buffer for older workers losing their jobs. The most dramatic difference arises when the sample is split by race. Non-whites have very inadequate savings relative to whites; almost half of non-whites have gross financial assets that are less than 10% of the expected income loss, and only 28% have gross assets that are more than the expected loss. This finding suggests important racial heterogeneity in adequacy.

The final row redoes the analysis dividing the sample into those who are on temporary layoff and those who are without a job. The findings here are striking: savings is much more adequate for those on temporary layoff. This is true both because absolute wealth holdings are higher for temporary layoffs, and because spells are much shorter. This higher wealth adequacy for temporary layoffs is consistent with the notion that temporary layoff is an expected event for which workers can prepare by increasing savings, as reflected in the smaller consumption smoothing role of UI for temporary layoffs (Gruber, 1997).

*Heterogeneity by Spell Duration*

The last result in Table 4 suggests the value of exploring further the distribution of wealth adequacy by spell duration. I do so in Table 5, for five groups: those with spells of one month or less; those with spells of 2-3 months; those with spells of 4-6 months; those with spells of 7-12 months; and those with spells of more than one year. I once again show the median dollars of gross financial assets, the median

relative to income loss, and the distribution of wealth/income loss. As a basis of comparison, I also show in the final columns the median wealth and wealth/income loss for labor force leavers. Income loss for this group is defined analogously to the unemployed.

The results in Table 5 are striking. For the unemployed, ex-ante absolute wealth holdings actually fall with realized unemployment duration, so that adequacy drops very rapidly with duration. For the shortest duration group, wealth is much more than adequate to finance the spell at the median, and 2/3 of the group has wealth that is larger than the expected income loss. But for the longest duration group, wealth only finances 7% of the expected income loss at the median, and over one-half of the group has wealth that is less than 10% of the expected loss.[14] Thus, there is a clear negative relationship here between duration and adequacy. Along with the results for temporary layoffs, this has important implications for the design of UI benefit payout streams, which I discuss further in the conclusion.

This finding stands in contrast to the results for labor force leavers. For that group, wealth is roughly constant across the distribution of durations. The ratio of wealth to income loss does fall for this group as well, but not nearly as precipitously.[15]

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[14]Note that this also suggests that there is unlikely to be an important effect of ex ante wealth on durations; while the negative correlation does not prove that there is no wealth effect, it certainly shows that it is not very large relative to other factors determining durations.

[15]One possible explanation for this finding is a correlation between unemployment durations and the length of previous employment spells. Individuals who have longer unemployment spells may be the ones with the weakest attachment to the labor force, and may have had another recent spell of unemployment, so that they had drawn down their wealth before the most recent spell began. In fact, however, in results not reported here, I find that there is not a strong relationship between previous employment duration and wealth adequacy. If anything, adequacy is lower for those with longer previous employment durations; despite the fact that wealth holdings are higher, previous wages are higher as well, so more wealth is needed to replace lost earnings.

## Part IV: Wealth Use During the Unemployment Spell

The results thus far have explored the adequacy of savings relative to income risk from unemployment. But the underlying presumption in this discussion is that individuals will use their savings to finance consumption during unemployment. This pattern of disavings would be consistent with any precautionary savings model. But there is much about individual savings behavior that is not well understood by economists, particularly with reference to the lower parts of the income distribution. If savings is serving some purpose other than as a precautionary buffer, then individuals may be reluctant to access it during their unemployment spells. In that case, it is inappropriate to interpret the earlier results as suggesting that a large fraction of workers, particularly in some subgroups such as those with short unemployment durations, can easily maintain their consumption during unemployment spells.

In order to investigate this issue, I turn to a different type of analysis: an estimation of the impact of UI generosity on wealth utilization during spells. If individuals are saving for precautionary purposes, then as UI generosity rises, there will be less drawdown of own wealth to finance unemployment spells. On the other hand, if individuals are reluctant to use their existing wealth stocks to finance consumption during unemployment, then there will be no relationship between UI generosity and wealth changes.

To assess this issue, I estimate regression models of the form:

$$(2)\ ?\log(W_i) = a + ß_1 UIRR_i + ß_2 X_i + ß_3 d_j + ß_4 t_t + e_i$$

where $W_i$ is individual i's wealth holdings
UIRR is the potential UI replacement rate
X is a vector of individual characteristics
$d_j$ is a full set of state dummies
$t_t$ is a full set of panel dummies

In this model, the change in log wealth is regressed on the replacement rate and a set of controls for individual characteristics, state dummies, and time (panel dummies). If more generous UI causes individuals to use their wealth less during unemployment spells, then the coefficient $ß_1$ will be positive. That is, a higher replacement ratio leads to a smaller drawdown of wealth from unemployment, so that relative to other unemployed workers there is a positive change in wealth for the high replacement rate worker.

I use the change in log wealth since the distribution of wealth is highly skewed. The disadvantage of this approach is that there is a non-trivial share of the sample with zero wealth holdings; roughly 17% of the sample in each period has zero gross financial wealth, and a total of 30% of the sample has zero wealth in one of the two periods. If there is a correlation between UI and having zero wealth holdings in either period, this will lead to a sample selection bias to the estimates. In order to address this problem, I estimate both the model above, and a "heckit" sample selection correction model which uses the effect of UI on having zero wealth to correct for any selection bias to the estimates.[16] For this reason as well, I only estimate models for gross financial wealth, since there are relatively few non-positive values; this selection is much more of a problem for net financial wealth. Moreover, the sample of changes for both net financial and net total wealth is much smaller, due to the fact that data is available in only 1984-1986.

The most important regressors in X are a trilinear spline in base period wage, high quarter wage, and 1/weekly wage. These three variables jointly determine eligibility and benefits entitlement for UI, and they may be independently correlated with wealth accumulation decisions. Moreover, they determine benefits in a joint fashion, for example because the replacement rate (which is a ratio of a function of the

[16]Since I do not have any excluded instruments which affect having zero wealth holdings but not the level of wealth holdings, this selection correction is identified solely from the assumption of joint normality between the error terms in the selection and ? log wealth equations.

high quarter wage to the weekly wage) only enters for those determined to be eligible (which is a function of base period wage and the distribution of earnings inside and outside the high quarter). To form the trilinear spline, I choose as knot points the 10th, 25th, 50th, 75th, and 90th percentiles of the wage distribution of searchers. The trilinear spline then controls for each segment of the spline for each of the three variables, as well as interactions of these segments across variables.[17] The other controls in X include age and its square, sex, marital status, race, and education.

The results of this regression analysis are presented in Table 6. The first panel shows the results for the unemployed. The first column presents the regression for change in log wealth with no correction for sample selection. In the final row of that column I show the coefficient on the replacement rate from a probit regression of the sample selection dummy (which is one if there is zero wealth in either period and 0 otherwise) on the right hand side variables in equation (2). In the second column, I then include the sample selection correction; the coefficient on the included mills ratio is shown at the bottom of the second column.

The results in these first two columns are supportive of a role for UI in affecting the use of wealth during unemployment spells. In both columns, the coefficient on the replacement rate is positive and significant, indicating that individuals draw their wealth down less rapidly as UI benefits are more generous.

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[17]More precisely, I measure the $10^{th}$, $25^{th}$, $50^{th}$, $75^{th}$, and $90^{th}$ percentiles of the distributions of 1/weekly wage (average over base period), high quarter earnings, and annual earnings. These three variables represent the set of earnings controls that determine UI benefits and eligibility; 1/weekly wage is used since the replacement rate is a function of this inverse. For each of these earnings concepts, I then form five variables which are of the form max(0,Y-X), where Y is one of the earnings concepts above, and X is each of the percentile points, as well as using the actual earnings level Y. I then fully interact all 18 of these variables with each other, to control for the not only the distribution of each earnings concept, but the full joint distribution of the set of earnings concepts which jointly determine UI benefits and eligibility. The programs for making the splines and running these regressions are available upon request.

This is consistent with the evidence in Engen and Gruber (1996) that wealth is accumulated by employed persons differentially in response to UI generosity. The coefficient in the first column indicates that for every 10 percentage point rise in the replacement rate, the reduction in wealth holdings during an unemployment spell is 7.9% less; the key point is that wealth would be falling in the absence of UI, and the role played by UI is to mitigate that fall. That is, at the sample average replacement rate of roughly 45 percentage points, wealth holdings rise by 36% during unemployment spells relative to how much they would fall if there were no UI. In other words, UI is playing a significant role in reducing the drawdown of wealth during unemployment spells.[18]

The final row of the first column shows that, in fact, there is a significant relationship between being in the sample (having non-zero wealth in both periods) and the potential UI replacement rate. This suggests the potential for sample selection bias. The second column tries to account for this bias by incorporating a sample selection correction (the mills ratio). This raises somewhat the coefficient on the replacement rate.

The remaining columns of Table 6 assess the robustness of this conclusion by rerunning these regressions for the control samples, labor force leavers and the employed. If there is a causal relationship between UI and wealth changes, there should be no effect on these groups, who cannot avail themselves of UI benefits. However, if the results are driven by some spurious correlation between the construction of potential UI benefits and wealth changes, then I may find a similarly positive relationship for these samples.

In fact, there is no evidence of a sizeable positive effect of UI on wealth changes for either sample,

[18]Note that I do not incorporate actual unemployment durations into the regression model. This is because durations are endogenous to both wealth holdings and to UI.

either with or without selection corrections. In fact, the results for labor force leavers are negative, and the estimates for the employed are small and insignificant. Thus, the conclusions for the unemployed do not appear to be driven by some omitted factor.

## Part V: Conclusions and Implications

The adequacy of UI benefits is a key consideration for reform of the UI system, and that adequacy will be directly tied to the ability of the unemployed to insure their spells through drawing down their own wealth. This paper has considered both the ex-ante adequacy of wealth holdings of the unemployed, and how those wealth holdings are used during unemployment spells. I find that there is substantial heterogeneity in the extent of ex-ante wealth holdings among the unemployed. For the median worker becoming unemployed, ex ante gross financial asset holdings are sufficient to replace 5.4 weeks of earnings, and roughly three-quarters of their realized income loss from unemployment spells. But older and white workers have wealth holdings which are roughly equal to their income loss during unemployment spells, and those on temporary layoff have ex-ante wealth holdings which substantially exceed their ex-post income loss. And ex-ante wealth holdings decline precipitously with realized unemployment durations, *both* absolutely and (especially) relative to ex-post income loss.

I also find strong evidence that individuals who are eligible for more generous UI draw down their wealth more slowly during unemployment spells. This demonstrates that wealth is used as a consumption smoothing device alongside UI to cope with the income loss from unemployment.

An important question is how these results can inform the debate over the optimal structure of the UI system. As nicely reviewed by Karni (1999), there have been a number of articles in recent years which

consider theoretically the optimal design of UI, and the findings here inform two conclusions of that literature. The first, originally from Baily (1977), is that the optimal level of UI benefits will be a function of the private resources that individuals have to smooth their consumption during unemployment spells. This analysis shows that many unemployed workers have substantial

assets to supplement their UI benefits in smoothing consumption over the unemployment spell, and that they appear to use those assets in combination with UI for consumption smoothing purposes. This is consistent with the finding of Gruber (1997) that only a minority of UI income is translated to additional consumption during unemployment spells.

The second conclusion is about the optimal time pattern of UI benefits. The general conclusions of analyses such as Shavell and Weiss (1979) and Hopenhayn and Nicolini (1997) is that UI benefits should decline over time: to provide incentives for the unemployed to find jobs, being unemployed must become less attractive over time. At the same time, Davidson and Woodbury (1997) conclude that the optimal UI program will have low benefits that never expire.

As Shavell and Wise note, however, the optimal time pattern becomes indeterminate if individuals have wealth holdings at the start of their unemployment spells, since the efficiency gains of a declining profile must be weighed against the rising marginal utility of consumption of individuals run through their wealth holdings. Moreover, these theoretical analysis impose a representative agent assumption. In reality, the unemployed population is quite diverse, particularly along the lines of wealth holdings. If, as is shown above, those with longer unemployment spells have lower ex ante wealth holdings, this can offset the efficiency arguments for a declining profile. For example, models such as Shavell and Weiss might imply, given this heterogeneity, that benefits even increase over some interval, or that there be a non-trivial waiting

period before UI benefits begin, with the savings to the UI system passed on to those with longer spells.

In summary, the optimal time pattern will trade off the efficiency properties of a declining benefits profile against the insurance loss of such a decline when individuals have limited wealth, and particularly when that wealth is much lower ex ante for those with longer spells. An important direction to take the theoretical literature in this area is to consider wealth heterogeneity in determining optimal time patterns.

There is also much less adequate wealth holdings for important subgroups of the population such as minorities. While it is difficult to conceive of a racial or age-targeted UI system, these results do raise the larger issue of further means- or asset-testing UI benefits. Asset testing would most directly address the issues raised in this paper, but could have detrimental impacts on asset accumulation; as Powers (1996) and Gruber and Yelowitz (1999) show, savings is very responsive to asset testing through social insurance programs. The administrative issues associated with asset testing are also somewhat daunting. Further income testing could indirectly address these issues, as asset holdings are strongly correlated with income, and the UI system has precise measures of ex-ante income.

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Table 1: Ex-Ante Wealth Holdings of the Unemployed

| | Gross Financial | Net Financial | Net Total |
|---|---|---|---|
| | Levels of Wealth ($1994) | | |
| 10th pctile | 0 | -7086 | -413 |
| 25th pctile | 66 | -2098 | 2066 |
| 50th pctile | 1171 | 0 | 21865 |
| 75th pctile | 7052 | 4352 | 83,102 |
| 90th pctile | 28,235 | 24,510 | 175,526 |
| | Relative to Earnings | | |
| 10th pctile | 0.00 | 0.00 | 0.00 |
| 25th pctile | 0.34 | 0.00 | 10.36 |
| 50th pctile | 5.35 | 0.00 | 96.18 |
| 75th pctile | 33.73 | 18.56 | 404.23 |
| 90th pctile | 159.58 | 129.10 | 1125.64 |
| Number of Obs | 15070 | 12679 | 12679 |

Notes: Data tabulated from SIPP. The top panel presents the distribution of real (1994$) wealth holdings, and the bottom half normalizes holdings by after-tax weekly earnings in high or last quarter.

Table 2: Wealth Holdings of Other Groups

| | Gross Financial | | Net Financial | | Net Total | |
|---|---|---|---|---|---|---|
| **Labor Force Leavers** | | | | | | |
| | Dollars $1994 | Relative to Earn | Dollars $1994 | Relative to Earn | Dollars $1994 | Relative to Earn |
| 10th pctile | 0 | 0 | -7472 | 0 | 0 | 0 |
| 25th pctile | 404 | 1.98 | -1868 | 0 | 6421 | 32.7 |
| 50th pctile | 2952 | 15.72 | 513 | 2.53 | 49,022 | 230.4 |
| 75th pctile | 15,012 | 92.82 | 11,745 | 64.69 | 132,009 | 838.4 |
| 90th pctile | 54,289 | 423.3 | 51,087 | 357.4 | 257,636 | 2533 |
| Number of Obs | 21,660 | 21,660 | 17,964 | 17,964 | 17,964 | 17,964 |
| **Employed** | | | | | | |
| | Gross Financial | | Net Financial | | Net Total | |
| | Dollars $1994 | Relative to Earn | Dollars $1994 | Relative to Earn | Dollars $1994 | Relative to Earn |
| 10th pctile | 106 | 0.3 | -6816 | 0 | 947 | 3.05 |
| 25th pctile | 859 | 2.39 | -1392 | 0 | 12,128 | 32.5 |
| 50th pctile | 4173 | 10.24 | 1584 | 4.01 | 53,605 | 122.5 |
| 75th pctile | 17006 | 38.76 | 13,763 | 31.26 | 130,984 | 297.3 |
| 90th pctile | 53,342 | 118.6 | 49,859 | 108.12 | 247,585 | 612.3 |
| Number of Obs | 22,112 | 15,315 | 19,711 | 12,432 | 19,711 | 19,711 |

Notes: First column of each pair is real wealth holdings; second is wealth relative to after-tax last quarter

wage.  Top half of table is for labor force leavers; bottom half for the employed.

Table 3: Wealth Holdings of Unemployed Relative to Income Loss

| | Gross Financial Assets | | | Net Financial Assets | | | Net Worth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Earn | UI Elig | UI Receipt | Earn | UI Elig | UI Receipt | Earn | UI Elig | UI Receipt |
| Median | 0.56 | 1.19 | 0.73 | 0.00 | 0.00 | 0.00 | 8.73 | 18.22 | 11.65 |
| <10% of loss | 0.33 | 0.28 | 0.30 | 0.57 | 0.58 | 0.57 | 0.17 | 0.16 | 0.16 |
| <25% of loss | 0.41 | 0.34 | 0.38 | 0.61 | 0.62 | 0.60 | 0.19 | 0.18 | 0.18 |
| <50% of loss | 0.49 | 0.41 | 0.45 | 0.65 | 0.66 | 0.64 | 0.22 | 0.21 | 0.21 |
| <100% of loss | 0.59 | 0.48 | 0.54 | 0.70 | 0.71 | 0.68 | 0.26 | 0.25 | 0.25 |

Notes: First row shows median values for ratio of wealth to income loss; remaining rows present distribution of wealth/income loss. Income loss is defined in three ways: ignoring UI income; accounting for UI benefits for which workers is eligible; and accounting for UI benefits receipt.

Table 4: Gross Financial Wealth Holdings Relative to Income Loss
By Subgroup - Income Loss includes UI Receipt

| | Median Dollars | Relative to Income Loss | <10% of loss | <25% of loss | <50% of loss | <100% of loss |
|---|---|---|---|---|---|---|
| Men | 1206 | 0.67 | 0.31 | 0.39 | 0.46 | 0.55 |
| Women | 1128 | 0.82 | 0.29 | 0.37 | 0.44 | 0.52 |
| Married Men | 1048 | 0.54 | 0.33 | 0.41 | 0.48 | 0.58 |
| Married Women | 1195 | 0.82 | 0.28 | 0.36 | 0.43 | 0.52 |
| Men < 45 | 972 | 0.58 | 0.33 | 0.40 | 0.47 | 0.56 |
| Men >= 45 | 2868 | 1.15 | 0.24 | 0.32 | 0.39 | 0.48 |
| Whites | 1470 | 0.94 | 0.27 | 0.34 | 0.42 | 0.50 |
| Non-Whites | 269 | 0.10 | 0.49 | 0.57 | 0.64 | 0.72 |
| Job Separations | 1088 | 0.58 | 0.32 | 0.40 | 0.48 | 0.56 |
| Temp Layoffs | 1494 | 1.80 | 0.23 | 0.29 | 0.34 | 0.42 |

Notes: Data for gross financial wealth holdings of different subgroups. First column shows median of absolute wealth; second shows median of wealth to income loss, including UI receipt; remaining columns show distribution of wealth/loss.

| | | | | | | |
|---|---|---|---|---|---|---|
| | Median rel to last qtr | 7.81 | 2.09 | 1.07 | 0.62 | 0.30 |
| Leavers Labor Force | | | | | | |
| | Median Dollars | 2505 | 3281 | 3208 | 3665 | 2665 |
| | <100% of loss | 0.33 | 0.51 | 0.63 | 0.72 | 0.80 |
| | <50% of loss | 0.26 | 0.41 | 0.53 | 0.63 | 0.73 |
| | <25% of loss | 0.23 | 0.34 | 0.44 | 0.54 | 0.65 |
| Unemployed | | | | | | |
| | <10% of loss | 0.19 | 0.27 | 0.34 | 0.43 | 0.54 |
| | Loss Relative to Income | 3.74 | 0.92 | 0.39 | 0.18 | 0.07 |
| | Median Dollars | 1320 | 1283 | 1173 | 963 | 676 |
| | | <=1 month | 2 to 3 months | 4 to 6 months | 7 to 12 months | >12 months |

Table 6: Regression Results

| | Unemployed | | Labor Force Leavers | | Employed | |
|---|---|---|---|---|---|---|
| Replacement Rate | 0.785 | 1.284 | -0.519 | -0.517 | 0.183 | 0.109 |
| | (0.330) | (0.474) | (0.231) | (0.258) | (0.201) | (0.224) |
| Age | 0.042 | 0.094 | 0.003 | 0.004 | 0.008 | -0.003 |
| | (0.013) | (0.038) | (0.009) | (0.022) | (0.008) | (0.018) |
| Age Squared/100 | -0.052 | -0.122 | -0.001 | -0.003 | -0.007 | 0.006 |
| | (0.017) | (0.051) | (0.011) | (0.032) | (0.010) | (0.021) |
| Married | 0.093 | -0.039 | 0.050 | 0.046 | 0.084 | 0.172 |
| | (0.051) | (0.103) | (0.039) | (0.105) | (0.028) | (0.131) |
| White | 0.034 | -0.351 | -0.018 | -0.031 | 0.107 | 0.187 |
| | (0.070) | (0.271) | (0.052) | (0.273) | (0.037) | (0.264) |
| Sex | -0.086 | -0.226 | 0.066 | 0.063 | -0.008 | 0.081 |
| | (0.046) | (0.106) | (0.035) | (0.073) | (0.025) | (0.134) |
| Less than HS Education | 0.038 | 0.767 | -0.029 | -0.003 | 0.061 | -0.209 |
| | (0.078) | (0.502) | (0.056) | (0.525) | (0.047) | (0.396) |
| HS Graduate Only | 0.004 | 0.450 | -0.061 | -0.045 | 0.021 | -0.121 |
| | (0.065) | (0.311) | (0.044) | (0.331) | (0.030) | (0.208) |
| Some College | 0.164 | 0.315 | -0.061 | -0.055 | 0.011 | -0.040 |
| | (0.067) | (0.122) | (0.044) | (0.146) | (0.030) | (0.078) |
| Mills Ratio | | 1.055 | | 0.031 | | -0.388 |
| | | (0.718) | | (0.628) | | (0.564) |
| Number of Obs | 9048 | 9048 | 14244 | 14244 | 20641 | 20641 |
| Selection Probit Coefficient | 0.614 | | 0.235 | | 0.201 | |
| | (0.209) | | (0.182) | | (0.218) | |
| Number of Obs | 12411 | | 17859 | | 22884 | |

Notes: Standard errors in parentheses. Dependent variable is change in log real wealth. First set of columns shows results for unemployed; second set for labor force leavers; and third set for the employed. First column in each set presents OLS regression results; at bottom of these columns are coefficients on replacement rate from a selection probit for having zero wealth in either period. Second column in each set presents selection-corrected regressions. Regressions include a trilinear spline in base period wage, high quarter wage, and 1/weekly wage.